

10/01/99
jc586 U.S. PTO

Case Docket No. 60,130-569

Date: October 1, 1999

A

BOX PATENT APPLICATION

Assistant Commissioner of Patents
Washington, D. C. 20231

Dear Sir:

Transmitted herewith for filing is a Patent Application of:

Inventor(s): Dennis A. Kramer
For : DIAGNOSTIC REMOTE CONTROL

Enclosed are:

- X 2 Sheets of drawings -- Formal, X Informal
X An Assignment of the invention to Meritor Heavy Vehicle Systems, L.L.C.
X A Combined Declaration and Power of Attorney.
 A Verified Statement By Assignee Claiming Small Entity Status
 An Associate Power of Attorney
X A Preliminary Amendment.
 Information Disclosure Statement and PTO Form 1449 with copies of cited patents

jc511 U.S. PTO
09/411730
10/01/99


The filing fee has been calculated as shown below:

	No. Filed	No. Extra	Small Entity		Large Entity	
Basic Fee						\$ 760.00
Total Claims	15-20	-0-	@ \$ 9	-0-	@ \$ 18.00	-0-
Indep. Claims	3-3	-0-	@ 39	-0-	@ \$ 78.00	-0-
Multiple Depend. Claim(s) Present <u> </u>			\$ 260.00			
TOTAL \$ <u> </u>				TOTAL \$ <u>760.00</u>		

- Please charge my Deposit Account No. 08-2789 in the amount of \$. A duplicate copy of this sheet is enclosed.
- X A check in the amount of \$ 760.00 To cover the filing fee is enclosed.
- X The Commissioner is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. 08-2789. A duplicate copy of this sheet is enclosed.
- X Any additional filing fees required under 37 CFR § 1.16.
- X Any patent application processing fees under 37 CFR § 1.17.

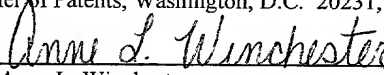
Respectfully Submitted,

HOWARD & HOWARD


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CERTIFICATE OF MAILING BY EXPRESS MAIL

I hereby certify that the enclosed paper or fee is being deposited with the United States Postal Service as Express Mail, postage prepaid, in an envelope as Express Mail Post Office to Addressee, **Mailing Label No. EL270041245US** and addressed to Box Patent Application, Assistant Commissioner of Patents, Washington, D.C. 20231, on October 1, 1999


Anne L. Winchester

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Kramer
Serial No.: Not Yet Assigned
Filed: Concurrently Herewith
Group Art Unit: Unknown
Examiner: Unknown
Title: DIAGNOSTIC REMOTE CONTROL

PRELIMINARY AMENDMENT

Assistant Commissioner of Patents
Washington, D.C. 20231

Dear Sir:

Please amend the application in the following particulars prior to Examination.

IN THE SUMMARY OF INVENTION:

Page 3, line 1 of paragraph 1, please delete "breaks" and substitute therefor --brake--.

IN THE CLAIMS:

Please add the following new claim:

16. (NEW) A method as set forth in claim 6 wherein said step of wiring the receiver to the electrical components is further defined by wiring the receiver to a J1708/J1587 electronic data bus for by-passing the electronic control device for directly signaling the electrical components.

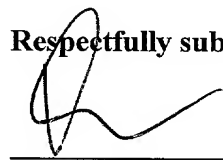
REMARKS

By this Preliminary Amendment a typographical error associated with the Application as Filed is being corrected.

In addition, dependant claim 16 relating back to claim 6 has been added for further defining the claimed invention.

Date: 1/04/1999

Respectfully submitted,



Theodore W. Olds, Registration No. 33,080

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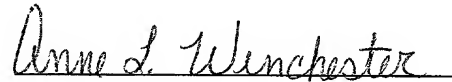
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Enclosures

TWO/GDD/alw

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Anne Winchester

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DIAGNOSTIC REMOTE CONTROL

BACKGROUND OF THE INVENTION

The invention relates to a method for performing diagnostic analysis on electronic
5 components of a vehicle. More specifically, the invention relates to a method for
actuating the electronic components of a vehicle for performing the diagnostic analysis.

Heavy duty vehicles require frequent maintenance checks on electrical
components such as, for example, brakes, differentials, ABS valves, turn signal lamps,
10 brake lamps, and any component having an electrically actuated input. Occasionally,
these checks need to be performed by the vehicle operator while the vehicle is in the
field. These maintenance checks require that the electrical components be actuated while
performing diagnostic analysis on the components. Additionally, diagnostic analysis of
these components requires visually inspecting the components while the components are
15 being actuated.

Currently, the method for actuating the electrical components requires two
technicians. A first technician sits in the vehicle cab and actuates the components upon
the verbal commands of a second technician that is outside the cab visually inspecting
20 the components. The inability to remotely actuate the electrical components for
performing diagnostic analysis prevents a single technician from performing the analysis.
Additionally, a single operator is not able to conduct a maintenance check while alone
in the field.

Therefore, a need exists for a method of actuating vehicle electrical components for performing diagnostic analysis on the components while outside the vehicle cab. This would enable a single technician, or even a single operator to perform maintenance
5 checks on the vehicle electrical components.

SUMMARY OF THE INVENTION AND ADVANTAGES

As disclosed in the embodiment of this invention, a method of actuating electrical components of a vehicle for performing diagnostic analysis on the electrical components
10 includes relaying a signal from a remote transmitter to a receiver aboard a vehicle, and actuating electrical components on the vehicle in response to the signal from the transmitter.

Actuating the electrical components on a vehicle with a remote transmitter allows
15 for a single technician to perform visual diagnostic analysis on the electrical components without the assistance of a second technician. Therefore, the technician can actuate the electrical components with the remote transmitter while walking around the vehicle and inspecting the components. By eliminating the second technician the efficiency of performing maintenance checks is improved.

20

In addition, a vehicle operator can use the remote transmitter to perform diagnostic analysis on the electrical components while alone in the field. This allows the

operator to verify that electrical components such as, for example, the breaks lights are functioning properly without obtaining the assistance from another person.

BRIEF DESCRIPTION OF THE DRAWINGS

5

Other advantages of the present invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

Figure 1 is a schematic of the present invention showing an electronic control
10 device; and

Figure 2 is an alternative embodiment of the present invention bypassing the electronic control device.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

15 Referring to Figure 1, a schematic is generally shown at 10 for a method of actuating electrical components 12 of a vehicle 13 for performing diagnostic analysis on the electrical components 12. A heavy duty truck that is designed to pull cargo trailers or the like requires frequent diagnostic analysis of onboard electrical components 12 such as, for example, brakes, differentials, ABS valves, turn signal lamps, and brake lamps.
20 It is desirable for a single technician to both actuate and view the electronic components 12 that are being actuated. Therefore, the method includes relaying a signal from a remote transmitter 14, which is preferably hand held, to a receiver 16 aboard the vehicle

and actuating electrical components 12 on the vehicle in response to the signal from the transmitter 14.

The method further includes the step of performing diagnostic analysis upon the electrical components 12 of the vehicle while actuating the electrical components 12 with the remote transmitter 14. The remote control transmitter 14 allows the technician to walk around the vehicle and actuate electronic components 12 when desired upon depressing buttons 18 on the transmitter 14. The transmitter 14 can include several buttons 18, one for each electrical component, or alternatively, only one button 18 that actuates some of, or all of the components 12 simultaneously.

The step of relaying a signal from the remote transmitter 14 is further defined by transmitting a radio frequency signal from the remote transmitter 14 to the vehicle receiver 16. The range of radio frequency transmission can be proximately limited to the location of the vehicle similar to the range of a remote keyless entry transmitter. In fact, the transmitter 14 and the receiver 16 can be similar to those used for remote keyless entry systems that are widely used in the light vehicle industry.

The method of actuating electrical components 12 of a vehicle for performing diagnostic analysis can be performed at an assembly plant by an original equipment manufacturer, or at a maintenance facility by a technician. The method can also be performed by a vehicle operator while in the field without the assistance of another

individual. While intended for use on heavy duty vehicles, the method can also be performed on light vehicles such as passenger cars and pickup trucks.

5 The method further includes the step of relaying the signal received by the receiver 16 to an electronic control device 20 located aboard the vehicle. Modern heavy duty vehicles include an on board electronic control device 20 programmed to operate the vehicle's electrical components 12 during operation of the truck. The control device 20 operates the engine, the transmission, and most of the electrical components aboard the vehicle.

10

The step of actuating the electrical components 12 is further defined by directing the electronic components 12 through an actuation cycle programmed into the electronic control device 20. The control device 20 communicates with vehicle electrical components 12, such as though J1708/J1587 data bus devices as is known in the art of electronic vehicle control. Therefore, the data bus devices can also used for relaying the actuation cycle from the control device 20 to the electrical components 12. The program is activated by the signal relayed by the receiver 16 and directs the components 12 through the actuation cycle. The cycle can include the actuation of several components 12, or of a single component.

20

A temporary program directing the actuation cycle can be entered into the electronic control device 20. The program can be erased subsequent to the diagnostic

evaluation of the electrical components 12. Alternatively, other ways of achieving the required actuation can be inserted into the inventive system.

5 An alternative embodiment, as shown in Figure 2, includes the step of wiring the receiver 116 to the electrical components 112 for bypassing the electronic control device 20 and directly signaling the electrical components 112. Therefore, the relay to the electrical components 112 would be directly from the receiver 116, and the J1708/J1587 data bus devices would be bypassed. Accordingly, the actuation of the electrical components would be a simple power/no power operation. Again, the appropriate
10 program to achieve the actuation, etc. would be within the skill level in this art.

An additional embodiment defines the step of relaying a signal from the remote transmitter 14 by transmitting a radio frequency signal from a remote transmitter 14 to a keyless entry receiver 16. The need for installing a designated receiver 16 for
15 performing diagnostics is eliminated by transmitting the radio frequency signal to the keyless entry receiver 16. The keyless entry receiver 16 can be either wired to the control device 20, for relaying the signal to the control device 20, or can be wired directly to the electrical components 12, for bypassing the control device 20.

20 Therefore, the method can include the step of relaying the signal received by the keyless entry receiver 16 to the electronic control device 20 located aboard the vehicle. Alternatively, the method can include the step of wiring the keyless entry receiver 16 to

the electrical components 12 for bypassing the electronic control device 20 for directly
signaling the electrical components 12.

The invention has been described in an illustrative manner, and it is to be
5 understood that the terminology which has been used is intended to be in the nature of
words of description rather than of limitation.

Obviously, many modifications and variations of the present invention are
possible in light of the above teachings. It is, therefore, to be understood that within the
10 scope of the appended claims, wherein reference numerals are merely for convenience
and are not to be in any way limiting, the invention may be practiced otherwise than as
specifically described.

CLAIMS

What is claimed is:

1. A method of actuating electrical components of a vehicle for performing diagnostic analysis on the electrical components, said method comprising:
5 relaying a signal from a remote transmitter to a receiver aboard a vehicle; and
actuating electrical components on the vehicle in response to the signal from the transmitter.
2. A method as set forth in claim 1 including the step of performing diagnostic
10 analysis upon the electrical components of the vehicle while actuating the electrical components with the remote transmitter.
3. A method as set forth in claim 2 wherein said step of relaying a signal from the remote transmitter is further defined by transmitting a radio frequency signal from a
15 remote transmitter to a vehicle receiver.
4. A method as set forth in claim 3 including the step of relaying the signal received by the receiver to an electronic control device located aboard the vehicle.
- 20 5. A method as set forth in claim 4 wherein said step of actuating the electrical components is further defined by directing the electronic components through an actuation cycle programmed into the electronic control device.

6. A method as set forth in claim 3 further including the step of wiring the receiver to the electrical components for by-passing the electronic control device for directly signaling the electrical components.

5 7. A method as set forth in claim 2 wherein said step of relaying a signal from the remote transmitter is further defined by transmitting a radio frequency signal from a remote transmitter to a keyless entry receiver.

10 8. A method as set forth in claim 7 including said step relaying the signal received by the keyless entry receiver to the electronic control device located aboard the vehicle.

15 9. A method as set forth in claim 8 further including the step of wiring the keyless entry receiver to the electrical components for by-passing the electronic control device for directly signaling the electrical components.

10. A method of actuating electrical components of a vehicle for performing diagnostic analysis on the electrical components, said method comprising:

programming an electronic control device on a vehicle with an actuation sequence
5 for vehicle electrical components;

transmitting a signal from a remote transmitter to a receiver aboard the vehicle;

relaying the signal to the electronic control device for beginning the actuation sequence of the electrical components in response to the signal from the transmitter; and

performing diagnostic analysis upon the electrical components while actuating
10 the electrical components with the remote transmitter.

11. A method as set forth in claim 10, said step of programming the electronic control device is further defined by entering a temporary program into the electronic control device for actuating the electrical components.

15

12. A method as set forth in claim 10 wherein said steps of transmitting a signal, and performing diagnostic analysis are executed by a single operator.

13. A method as set forth in claim 12 wherein said step of relaying a signal from
20 the remote transmitter is further defined by transmitting a radio frequency signal from a remote transmitter to a vehicle receiver.

14. A method as set forth in claim 12 wherein said step of relaying a signal from the remote transmitter is further defined by transmitting a radio frequency signal from a remote transmitter to a keyless entry receiver.

5 15. An apparatus for performing diagnostic analysis upon electronic components of a vehicle, wherein said apparatus comprises:

a remote transmitter for transmitting an actuation signal;

a receiver located aboard a vehicle for receiving the actuation signal from said remote transmitter and relaying an actuation signal to electrical components to be
10 actuated for diagnostic purposes.

DIAGNOSTIC REMOTE CONTROL

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ABSTRACT OF THE DISCLOSURE

A method of actuating electrical components of a vehicle, such as a heavy duty truck, for performing diagnostic analysis on the electrical components on the truck without the assistance of a technician is disclosed. The method includes relaying a signal from a remote transmitter to a receiver aboard a vehicle and actuating electrical components on the vehicle in response to the signal from the transmitter.

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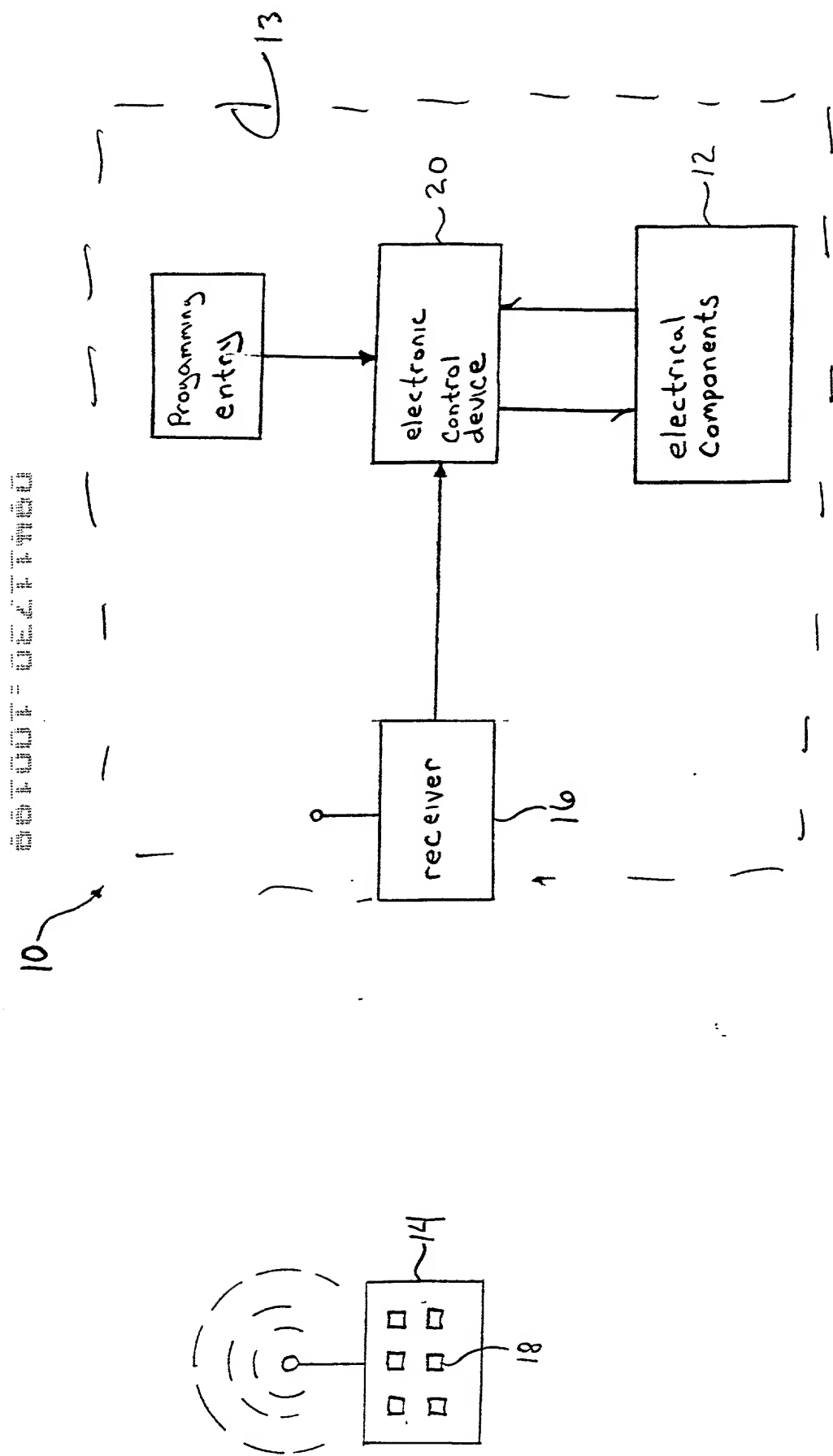


Figure 1

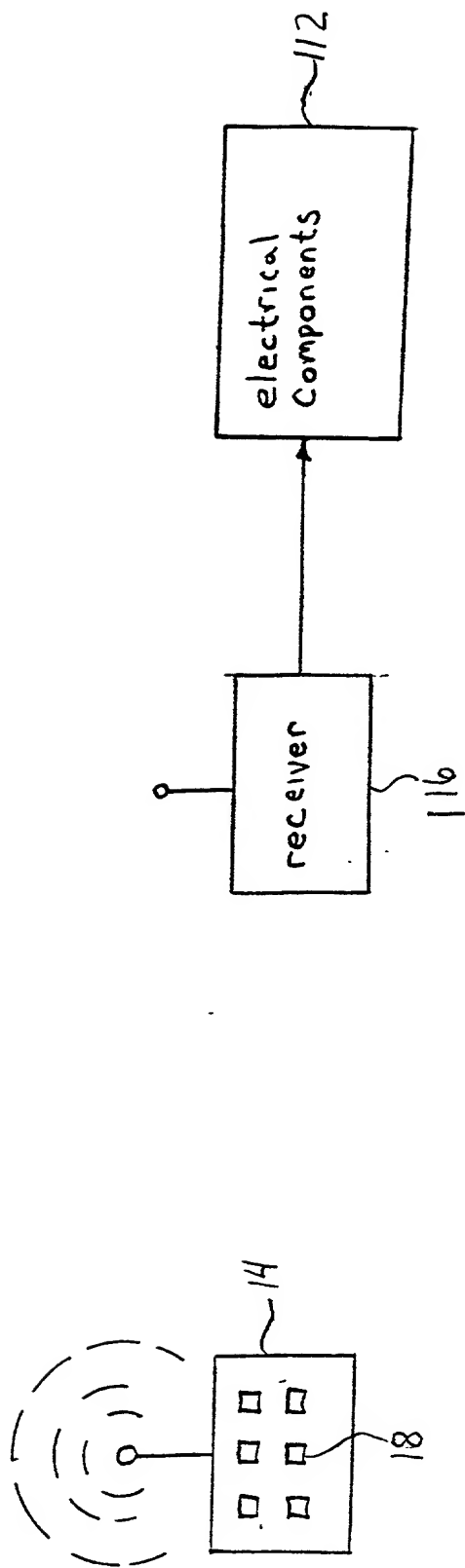


Figure 2

COMBINED DECLARATION AND POWER OF ATTORNEY

As the below named inventor, I hereby declare: that my residence, post office address and citizenship are as stated near my name below; that I believe I am the original, first and sole inventor of the subject matter of which is claimed and for which a patent is sought on the invention entitled

DIAGNOSTIC REMOTE CONTROL

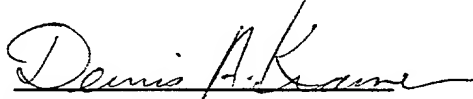
which is described and claimed in the attached specification and amended by an amendment thereto submitted therewith (if any); that I have reviewed and understand the contents of this specification, including the claims, as amended by any amendment referred to above; that I do not know and do not believe the same was ever known or used in the United States of America before my invention thereof or patented or described in any printed publication, in any country before my invention thereof for more than one year prior to this application, or in public use or on sale in the United States of America more than one year prior to this application; that the invention has not been patented or made the subject of an inventor's certificate issued before the date of this application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve (12) months prior to this application; that I acknowledge my duty to disclose information of which I am aware which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56(a); and that no application for patent or inventor's certificate on this invention has been filed in any country foreign to the United States of America prior to this application by me or my legal representatives or assigns except as follows: NONE.

I hereby appoint M. Lee Murrah, Registration No. 27,460; Theodore W. Olds, Registration No. 33,080; John E. Carlson, Registration No. 37,794; David J. Gaskey, Registration No. 37,139; Kerrie A. Laba, Registration No. 42,777 Randall L. Shoemaker, Registration No. 43,118; Samuel J. Haidle, Registration No. 42,619; William Gottschalk, Registration No. 44,130; William H. Honaker, Registration No. 31,623; Rhonda L. McCoy-Pfau, Registration No. 37,887; Harold W. Milton, Jr., Registration No. 22,180; Jeffrey A. Sadowski, Registration No. 29,005 and Raymond E. Scott, Registration No. 22,981 as our attorneys to prosecute this application and to transact all business in the Patent and Trademark Office and any foreign patent office connected herewith. Please address all correspondence and telephone calls to:

**Theodore W. Olds
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1400 North Woodward Avenue, Suite 101
Bloomfield Hills, Michigan 48304-2856
(248) 645-1483**

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Dated: Sept. 27, 1999


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Citizenship:

United States

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